DOCUMENT RESUME

ED 254 838 CS 007 968

AUTHOR Bowman, Harry L.; And Others
TITLE U. S. Navy Recruit Characteristics on Reading Comprehension and Related Variables: A Profile by Quarter for October 1980 - June 1984.
PUB DATE 85
NOTE 26p.; Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adults; Comparative Analysis; *Individual Characteristics; *Military Personnel; Program Effectiveness; *Reading Achievement; *Reading Comprehension; *Reading Research; Reading Strategies; Reading Tests; Recruitment; Research Methodology
IDENTIFIERS Military Recruitment; *Navy

ABSTRACT

A study was conducted to investigate reading comprehension and educationally related variables--such as years of education, aptitude score, high school graduation status, and quarter of entry into the service--that describe United States Navy recruits. Data were obtained from computer managed instruction (CMI) reports issued quarterly, on characteristics and test performance on the Gates-MacGinite Reading Comprehension Test and the Armed Services Vocational Aptitude Battery of 286,393 navy recruits between October 1980 and June 1984. Conclusions were derived from descriptive analyses and the results of testing five hypotheses pertaining to specific variables. The findings suggest that the recruit population remained relatively stable, while showing only slight variability with regard to years of education, reading comprehension skills, and aptitude scores. In addition, they showed that the trend of a decline in reading comprehension skill levels of recruits reported in previous studies has been reversed; that the recruits are likely to vary in different quarters of the year on some important factors, thereby requiring adjustments in administrative planning; and that information is available through the CMI reports on Navy recruit characteristics to improve the effectiveness of program management. (EL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED254838

U.S. NAVY RECRUIT CHARACTERISTICS ON READING COMPREHENSION AND RELATED VARIABLES: A PROFILE BY QUARTER FOR OCTOBER 1980 - JUNE 1984

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Harry L. Bowman
College of Education
Memphis State University
Memphis, Tennessee 38152

Norman J. Kerr
Dorothy M. Darcy
Chief of Naval Education and Training
Pensacola, Florida 32508

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Harry L. Bowman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CS 007 948

Paper presented at the 1985 Annual Meeting of the American Educational Research Association; Chicago, Illinois; March 31 - April 4, 1985

Introduction

The Department of the Navy initiated programs during World War II that were designed to remediate deficiencies in academic skills among selected personnel. These programs were operated without an official policy on remedial training in basic skills until 1978. The policy statement issued by the Secretary of the Navy on 2 June 1978 states: "It is the policy of the Department of the Navy to provide, when indicated, on-duty remedial job-relevant basic skills training in order to fill personnel requirements" (SECNAVINST 1510.3, 1978, p. 1). [Job-relevant basic skills are defined as "those capabilities prerequisite to efficient completion of Navy training programs, adequate job performance and career advancement. Notable among these are literacy, study and computational skills" (p. 1).] In addition to new programs being developed as a result of the policy statement, fundamental skills training programs that were already operational were given official recognition. One operational program, Academic Remedial Training (ART), provides instruction for recruits in basic reading and study skills as well as verbal skills needed to complete the demanding academic requirements of recruit training.

In 1967, the ART Program was officially initiated by the Naval Technical Training Command at each of the Navy's three Recruit Training Centers as a remedial reading course. The courses at the three sites evolved with dissimilar curricula and testing plans due to the autonomy permitted in course development. Consequently, the Chief of Naval Technical Training recognized a need for a standardized curriculum and testing plan. The prescribed curriculum and testing procedures were implemented in 1978 (CNTECHTRAINST 1540.42). The scope of the curriculum included both reading and study skills (Chief of Naval Technical Training, 1978; Bowman, Kaiser, Jones, & Petry, 1984). A verbal

skills curriculum that focuses on listening and speaking skills, primarily for recruits whose native language is not English, was added to the program at the Orlando and San Diego Recruit Training Centers in 1981 (Chief of Naval Technical Training, 1980).

The commitment of the Navy to provide fundamental skills training for enlisted personnel was reaffirmed through a policy statement by the Chief of Naval Operations in 1982. Specific skills identified for remediation were reading, mathematics, and communication skills (OPNAVINST 1510.11, 1982, p. 1). The policy states also: "A major goal of enlisted fundamental skills training is to achieve a minimum reading competency of the ninth grade" (p. 1).

Historically, the singular purpose of ART has been to assist recruits in acquiring the language skills required to complete recruit training successfully. While the ultimate purpose remains the same, the addition of the verbal skills component to the program expanded the scope of remediation to include listening and speaking skills of recruits whose primary language is not English. The population served by the program has been delimited to enlisted personnel who have not yet begun recruit training or have encountered academic difficulty after beginning recruit training.

The implementation of the standardized ART reading curriculum required the use of a Computer-Managed Instruction (CMI) system to perform test scoring functions. The CMI system was utilized to score the screening, diagnostic, and criterion tests employed in the program. A product of using the CMI system for test scoring is a data base on the reading comprehension skill levels and educationally related characteristics of all Navy recruits. In addition, data on skill deficiencies and criterion test performance of ART students are available from computer records. Monthly and quarterly reports on the educational, aptitudinal, and reading characteristics of the total recruit

accessions are routinely prepared for distribution to ART Program management personnel.

Problem

The problem defined for this study was to investigate the reading comprehension and educationally related characteristics and relationships among selected variables that describe the Navy's recruit population. The recruits who entered the Navy between October, 1980, and June, 1984, were the subjects who provided the data to address the problem. The variable of primary interest was the recruit's reading grade level (RGL) on comprehension. Other variables employed in the study were years of education, aptitude score, high school graduation status, and quarter of entry into the Navy.

Hypotheses

After performing descriptive analyses of the data on selected variables, five null hypotheses were tested statistically to identify differences among recruits on particular variables. The hypotheses tested were the following:

1. There is no difference in the distributions of recruits classified by high school graduation status and quarter of entry into the Navy.
2. There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and quarter of entry into the Navy.
3. There is no difference in the distributions of non-high school graduate recruits classifed by the 6.0 RGL criterion and quarter of entry into the Navy.
4. There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and quarter of entry into the Navy.

5. There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

The .05 level of significance was used in testing the hypotheses.

The significance of the study is based on three considerations. First, the investigation of reading comprehension skills of Navy recruits provides information to ascertain any changes in trends that have been observed in previous studies. Second, the analyses could identify factors on which the recruit population varies across a 15-quarter period. Such information would be useful to ART Program management personnel in planning for the allocation and utilization of resources (e.g. staff facilities, and instructional materials) more efficiently. In particular, variablity in the numbers of recruits who need reading remediation would have a direct effect on the requirements for staffing and instructional materials. Third, this study could demonstrate the desirability of using CMI system data to monitor and manage the ART Program. Since these data are reported routinely to program management personnel, the data are readily available to use in making decisions regarding program needs and operations.

Related Research

Many research studies have been conducted on the reading skill levels of Navy enlisted personnel and training materials because of the importance of reading skills for success in training and job performance. Hoiberg, Hysham, and Berry (1974) reported a significant relationship between reading skills and successful completion of the first enlistment term in the Navy. Biersner (1975) found that many Navy training manuals are written at the 12th grade reading ability level or higher. Zierdt (1976) and Sticht (1982) concluded that the reading abilities of many recruits do not meet the skill requirements

of widely used Navy materials.

Several studies have described the reading skill levels of the Navy recruit population based on the Gates-MacGinitie Reading Tests. Duffy and Nugent (1978) found a median RGL of 11.9 on comprehension as a result of testing 31,575 recruits at the Recruit Training Center in San Diego between May, 1974, and May, 1975. The data showed that 2.8% of the recruits scored below the 4.0 RGL and 9.6% scored below the 6.0 RGL. They concluded that the reading skill levels of many recruits are well below the readability levels of the print materials used in recruit training and daily job tasks.

Bowman and Kerr (1979) reported that a sample of 14,503 recruits tested in the first few months of 1979 had a median RGL of 11.0 on comprehension while 1.1% scored below the 4.0 RGL and 5.2% scored below the 6.0 RGL. In a one-year study (Bowman & Kerr, 1981), they found that 79,350 recruits who entered the Navy between June, 1980, and May, 1981, had a median RGL of 11.0 on comprehension with .7% scoring below the 4.0 RGL and 4.3% scoring below the 6.0 RGL. In a subsequent study (Bowman & Kerr, 1982) based on 84,123 recruits who entered the Navy between June, 1981, and May, 1982, they reported a median RGL of 11.2 while .5% scored below the 4.0 RGL and 3.6% scored below the 6.0 RGL. They found in a more recent study (Bowman & Kerr, 1983) on 77,347 recruits who entered the Navy between June, 1982, and May, 1983, that the median RGL was 11.4 with .9% scoring below the 4.0 RGL and 3.8% scoring below the 6.0 RGL. The latest study by Bowman, Kerr, and Darcy (1984) based on 67,740 recruits who entered the Navy between June, 1983, and May, 1984, revealed that the median RGL was 12.1 while .8% scored below the 4.0 RGL and 2.9% scored below the 6.0 RGL.

The research studies indicate that reading skills are strongly related to the success of Navy enlisted personnel while the readability levels of many

training and job materials are very demanding with respect to the skill levels required for their use. Descriptive research data reveal that the reading comprehension levels of recruits declined between 1974-75 and 1979. Later studies suggest that the median reading comprehension level of recruits has begun to increase after a brief period of stability at approximately the 11th grade level.

Procedures

The data utilized in this study were obtained from the quarterly CMI reports on Navy recruit characteristics and test performance. Data were available on 286,393 recruits who entered the Navy between October, 1980, and June, 1984. The reports provided data on four variables used in this study: years of education, high school graduation status, aptitude test scores, and reading comprehension grade level scores. A fifth variable, quarter of entry into the Navy, was defined by the quarter for which each report was prepared.

The Gates-MacGinitie Reading Comprehension Test (1978) and the Armed Services Vocational Aptitude Battery (1967-80) are the two tests for which data were reported. The Gates-MacGinitie, Levels D-F, is used as a screening instrument with all recruits who enter the Navy. (Only Level D was used prior to November, 1982.) An algorithm is used with the paragraph comprehension and verbal expression scores for the Armed Services Vocational Aptitude Battery to estimate the reading skill level of each recruit and to assign the appropriate level of the Gates-MacGinitie. During the time period covered by this study, the recruits who scored below the 6.0 RGL on the first administration of the Gates-MacGinitie were retested with an alternate form of Level D. (The data from the first administration of the Gates-MacGinitie are used in this study.) Recruits who scored below the 6.0 RGL on the second administration of the Gates-MacGinitie were assigned to ART. (Recruits may also be assigned to ART if

they encounter academic difficulties during recruit training.) The 6.0 RGL is not included as a possible score on the test norms.

The Armed Services Vocational Aptitude Battery (ASVAB) is administered to all recruits before they enlist in the Navy. The recruits included in this study had taken one of two series of ASVAB tests: Series 5-7 or Series 8-10. The aptitude score used in the study was the Armed Forces Qualification Test (AFQT) score. The AFQT is a normative percentile score that is derived from a composite of selected ASVAB scores. The scores used in the composite for ASVAB series 5-7 are the word knowledge, numerical operations, and space perception scores. On ASVAB series 8-10, the composite uses the word knowledge, paragraph comprehension, arithmetic reasoning, and numerical operations scores.

The quarterly CMI reports provided means for years of education, AFQT scores of recruits classified by the 6.0 RGL criterion (above or below), and RGL scores. The median was calculated for RGL scores by quarter. Frequency distributions were compiled and percentage distributions were computed for all recruits on high school graduation status and combinations of the variables on high school graduation status and the 6.0 RGL criterion. Proportions were calculated for high school graduate and non-high school graduate recruits who scored below the 6.0 RGL criterion.

A tabular format was used to present the means and medians as descriptive statistics. The Chi-square technique and confidence limits for differences in proportions were employed for the analyses related to testing the hypotheses. The Chi-square procedure provided comparisons of frequency distributions for high school graduation status and the 6.0 RGL criterion and high school graduation status by quarter of entry into the Navy. Confidence interval limits were computed to compare the proportions of high school graduates and non-high school graduates who scored below the 6.0 RGL by quarter and composite group.

Results

The results of the study are reported in a series of eight tables. The descriptive data are depicted in the first three tables. The remainder of the tables present the data and results of the inferential analyses related to the hypotheses.

Descriptive Data

Table 1 contains the means on years of education by quarter of entry into the Navy for the recruits. The composite mean for the 15-quarter time period was 11.8 years of education. The quarterly means varied by five months from 11.6 to 12.1 years. Means of 12.0 or 12.1 years occurred for the last five quarters from April, 1983, through June, 1984.

The means presented in Table 2 are derived from the AFQT percentile scores of recruits classified by the 6.0 RGL criterion and quarter of entry into the Navy. The composite means were 36.5 for all recruits who scored below the 6.0 RGL and 59.3 for all recruits who scored above the 6.0 RGL. Among the recruits with RGL scores below 6.0, the quarterly means ranged from 30.9 in October - December, 1981, to 42.3 in October - December, 1982. Among the recruits with RGL scores above 6.0, the quarterly means varied from a low of 56.8 in July - September, 1981, to a high of 61.9 in April - June, 1983. The differences in the means for the low and high RGL groups were about 23 percentile points for the composite means and ranged from 17 to 27 points by quarter. The differences between the low and high RGL groups were relatively stable during the 15-quarter period.

The medians and means for RGL of recruits by quarter of entry into the Navy are reported in Table 3. The median for the composite group was 11.6 RGL while the mean was 9.9 RGL. The quarterly medians ranged from 10.6 RGL in July - September, 1982, to 12.8 RGL in April - June, 1983. The means by quarter

Table 1

Means on Years of Education for Recruits by Quarter of Entry

Quarter	N	Mean
Oct. - Dec., 1980	15,299	11.6
Jan. - Mar., 1981	20,597	11.7
Apr. - June, 1981	20,770	11.6
July - Sept., 1981	29,265	11.7
Oct. - Dec., 1981	18,785	11.6
Jan. - Mar., 1982	15,485	11.7
Apr. - June, 1982	19,322	11.6
July - Sept., 1982	24,947	11.8
Oct. - Dec., 1982	18,431	11.8
Jan. - Mar., 1983	17,133	11.9
Apr. - June, 1983	15,713	12.1
July - Sept., 1983	18,002	12.1
Oct. - Dec., 1983	13,581	12.1
Jan. - Mar., 1984	16,506	12.1
Apr. - June, 1984	22,557	12.0
Total	286,393	11.8

Table 2

Means on the Armed Forces Qualification Test Scores for Recruits

by Sixth Reading Grade Level Criterion and Quarter of Entry

Quarter	Reading Grade Level Criterion			
	Below 6.0		Above 6.0	
	N	Mean	N	Mean
Oct. - Dec., 1980	551	37.6	14,738	58.9
Jan. - Mar., 1981	687	34.2	19,910	60.0
Apr. - June, 1981	763	34.8	20,007	58.5
July - Sept., 1981	1,047	32.4	28,218	56.8
Oct. - Dec., 1981	698	30.9	18,087	58.0
Jan. - Mar., 1982	553	34.0	14,932	59.5
Apr. - June, 1982	722	35.3	18,600	59.1
July - Sept., 1982	938	33.1	24,009	58.2
Oct. - Dec., 1982	910	42.3	17,521	59.6
Jan. - Mar., 1983	559	38.6	16,574	61.0
Apr. - June, 1983	504	40.2	15,209	61.9
July - Sept., 1983	458	40.4	17,544	59.4
Oct. - Dec., 1983	332	41.9	13,249	60.9
Jan. - Mar., 1984	471	40.3	16,035	60.7
Apr. - June, 1984	707	39.1	21,850	59.7
Total	9,900	36.5	276,483	59.3

Table 3

Medians and Means on Reading Grade Level for Recruits by Quarter of Entry

Quarter	N	Median	Mean
Oct. - Dec., 1980	15,299	11.2	9.8
Jan. - Mar., 1981	20,597	11.3	9.9
Apr. - June, 1981	20,770	11.5	10.0
July - Sept., 1981	29,265	11.5	9.9
Oct. - Dec., 1981	18,785	11.1	9.9
Jan. - Mar., 1982	15,485	11.1	9.8
Apr. - June, 1982	19,322	11.0	9.8
July - Sept., 1982	24,947	10.6	9.7
Oct. - Dec., 1982	18,431	11.5	9.7
Jan. - Mar., 1983	17,133	12.2	10.0
Apr. - June, 1983	15,713	12.8	10.0
July - Sept., 1983	18,002	12.1	10.0
Oct. - Dec., 1983	13,581	12.1	10.0
Jan. - Mar., 1984	16,506	12.1	10.0
Apr. - June, 1984	22,557	12.0	9.9
Total	286,393	11.6	9.9

varied from a low of 9.7 RGL in two quarters to a high of 10.0 RGL in six quarters. The quarterly medians were somewhat higher during the last six quarters when multi-level testing with the Gates-MacGinitie was used. The quarterly means did not reveal appreciable variability but tended to be slightly greater during the latter quarters of the time period.

Hypothesis 1

There is no difference in the distributions of recruits classified by high school graduation status and quarter of entry into the Navy. The frequency and percentage distributions of recruits classified by high school graduation status and quarter of entry are reported in Table 4. The data for the composite group revealed that 84% of the recruits were high school graduates. The percentages of high school graduates were below 80% during six of the first seven quarters. During the last five quarters, the percentages exceeded 90% for four of the quarters. The comparison of the frequency distributions of recruits on high school graduation status by quarter of entry utilizing the Chi-square procedure indicated that the distributions differed very significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 2

There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and quarter of entry into the Navy. Table 5 contains the frequency and percentage distributions of high school graduate recruits by the 6.0 RGL criterion and quarter of entry. The data for the composite group indicated that 3.56% of the high school graduate recruits scored below the 6.0 RGL on comprehension. The quarterly percentages varied from a low of 2.51% in October - December, 1983, to a high of 5.11% in

Table 4

Frequency and Percentage Distributions of Recruits by

High School Graduation Status and Quarter of Entry

Quarter	High School Graduate				
	Yes		No		Total
	f	%	f	%	f
Oct. - Dec., 1980	11,865	78.71	3,209	21.29	15,074
Jan. - Mar., 1981	15,688	77.58	4,533	22.42	20,221
Apr. - June, 1981	15,367	75.06	5,105	24.94	20,472
July - Sept., 1981	23,200	81.16	5,386	18.84	28,586
Oct. - Dec., 1981	13,834	75.84	4,406	24.16	18,240
Jan. - Mar., 1982	11,394	75.46	3,705	24.54	15,099
Apr. - June, 1982	13,966	74.52	4,775	25.48	18,741
July - Sept., 1982	21,112	87.26	3,081	12.74	24,193
Oct. - Dec., 1982	14,972	83.83	2,888	16.17	17,860
Jan. - Mar., 1983	14,653	87.88	2,020	12.12	16,673
Apr. - June, 1983	13,665	92.61	1,090	7.39	14,755
July - Sept., 1983	17,900	99.46	98	.54	17,998
Oct. - Dec., 1983	12,895	95.05	672	4.95	13,567
Jan. - Mar., 1984	15,500	93.97	995	6.03	16,495
Apr. - June, 1984	19,928	88.35	2,629	11.65	22,557
Total	235,939	84.10	44,592	15.90	280,531

Chi-square = 12,520.909 (Chi-square = 23.685, df = 14, level of significance = .05)

Table 5

Frequency and Percentage Distributions of High School Graduate Recruits by Sixth Reading Grade Level Criterion and Quarter of Entry

Quarter	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
	f	%	f	%	f
Oct. - Dec., 1980	482	4.06	11,383	95.94	11,865
Jan. - Mar., 1981	576	3.67	15,112	96.33	15,688
Apr. - June, 1981	597	3.88	14,770	96.12	15,367
July - Sept., 1981	855	3.69	22,345	96.31	23,200
Oct. - Dec., 1981	554	4.00	13,280	96.00	13,834
Jan. - Mar., 1982	426	3.74	10,968	96.26	11,394
Apr. - June, 1982	529	3.79	13,437	96.21	13,966
July - Sept., 1982	833	3.95	20,279	96.05	21,112
Oct. - Dec., 1982	765	5.11	14,207	94.89	14,972
Jan. - Mar., 1983	490	3.34	14,163	96.66	14,653
Apr. - June, 1983	436	3.19	13,229	96.81	13,665
July - Sept., 1983	455	2.54	17,445	97.46	17,900
Oct. - Dec., 1983	324	2.51	12,571	97.49	12,895
Jan. - Mar., 1984	441	2.85	15,059	97.15	15,500
Apr. - June, 1984	640	3.21	19,288	96.79	19,928
Total	8,403	3.56	227,536	96.44	235,939

Chi-square = 272.694 (Chi-square = 23.685, df = 14, level of significance = .05)

October - December, 1982. Although a consistent pattern is not evident, the percentages were generally lower during the latter quarters of the 15-quarter period. The results of the Chi-square comparison of the frequency distributions for high school graduate recruits by the 6.0 RGL criterion and quarter of entry showed that they differed significantly at the .05 level of significance. Consequently, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 3

There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and quarter of entry into the Navy. The frequency and percentage distributions of non-high school graduate recruits by the 6.0 RGL criterion and quarter of entry are depicted in Table 6. In the composite group, 2.46% of the recruits who were not high school graduates scored below the 6.0 RGL on comprehension. The quarterly percentages varied from a low of 1.10% in April - June, 1983, to a high of 3.60% in October - December, 1982. While the percentages were relatively stable during the first seven quarters, the percentages of non-high school graduate recruits scoring below the 6.0 RGL were considerably more variable during the last eight quarters. The Chi-square comparison of the frequency distributions of non-high school graduate recruits by the 6.0 RGL criterion and quarter of entry revealed that they differed significantly at the .05 level of signficance. Thus, the null hypothesis that the distributions are not different was rejected.

Hypothesis 4

There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and quarter of

Table 6

Frequency and Percentage Distributions of Non-High School Graduate Recruits by Sixth Reading Grade Level Criterion and Quarter of Entry

Quarter	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
	f	%	f	%	f
Oct. - Dec., 1980	66	2.06	3,143	97.94	3,209
Jan. - Mar., 1981	96	2.12	4,437	97.88	4,533
Apr. - June, 1981	139	2.72	4,966	97.28	5,105
July - Sept., 1981	154	2.86	5,232	97.14	5,386
Oct. - Dec., 1981	105	2.38	4,301	97.62	4,406
Jan. - Mar., 1982	93	2.51	3,612	97.49	3,705
Apr. - June, 1982	137	2.87	4,638	97.13	4,775
July - Sept., 1982	53	1.72	3,028	98.28	3,081
Oct. - Dec., 1982	104	3.60	2,784	96.40	2,888
Jan. - Mar., 1983	34	1.68	1,986	98.32	2,020
Apr. - June, 1983	12	1.10	1,078	98.90	1,090
July - Sept., 1983	2	2.04	96	97.96	98
Oct. - Dec., 1983	8	1.19	664	98.81	672
Jan. - Mar., 1984	29	2.91	966	97.09	995
Apr. - June, 1984	67	2.55	2,562	97.45	2,629
Total	1,099	2.46	43,493	97.54	44,592

Chi-square = 54.553 (Chi-square = 23.685, df = 14, level of significance = .05)

entry into the Navy. The frequency and percentage distributions are reported in Table 7 for the recruits who scored below the 6.0 RGL classified by high school graduation status and quarter of entry. The data showed that 88.43% of the recruits who obtained scores below the 6.0 RGL on comprehension were high school graduates. The quarterly percentages ranged from 79.43% in April - June, 1982, to 99.56% in July - September, 1983. The highest percentage occurred during a quarter when few non-high school graduates were allowed to enlist in the Navy. An elevation in percentages is evident during the latter quarters of the 15-quarter period. The comparison of the frequency distributions of recruits who scored below the 6.0 RGL classified by high school graduation status and quarter of entry using the Chi-square technique revealed that they differed significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 5

There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion. Table 8 presents data on the proportions of recruits who scored below the 6.0 RGL classified by high school graduation status and quarter of entry into the Navy. The data on the proportions of recruits who scored below the 6.0 RGL are discussed above as percentages for high school graduates and non-high school graduates separately. (See Tables 5 and 6.) An inspection of the relative proportions of the two groups revealed that a higher proportion (.0110) of the high school graduates than non-high school graduates obtained scores below the 6.0 RGL criterion for the 15-quarter period. In 14 of the 15-quarters (except for January - March, 1984), the high school graduates had the higher proportion. The confidence limits for the comparison of the difference in the

Table 7

Frequency and Percentage Distributions of Recruits Scoring Below Sixth Reading Grade Level by High School Graduation Status and Quarter of Entry

Quarter	High School Graduate				Total
	Yes		No		
	f	%	f	%	f
Oct. - Dec., 1980	482	87.96	66	12.04	548
Jan. - Mar., 1981	576	85.71	96	14.29	672
Apr. - June, 1981	597	81.11	139	18.89	736
July - Sept., 1981	855	84.74	154	15.26	1,009
Oct. - Dec., 1981	554	84.07	105	15.83	659
Jan. - Mar., 1982	426	82.08	93	17.92	519
Apr. - June, 1982	529	79.43	137	20.57	666
July - Sept., 1982	833	94.02	53	5.98	886
Oct. - Dec., 1982	765	88.03	104	11.97	869
Jan. - Mar., 1983	490	93.51	34	6.49	524
Apr. - June, 1983	436	97.32	12	2.68	448
July - Sept., 1983	455	99.56	2	.44	457
Oct. - Dec., 1983	324	97.59	8	2.41	332
Jan. - Mar., 1984	441	93.83	29	6.17	470
Apr. - June, 1984	640	90.52	67	9.48	707
Total	8,403	88.43	1,099	11.57	9,502

Chi-square = 314.414 (Chi-square = 23.685, df = 14, level of significance = .05)

Table 8

Comparison of Proportions of Recruits Scoring Below Sixth Reading Grade Level by High School Graduation Status and Quarter of Entry

Quarter	High School Graduate: Yes		High School Graduate: No		Confidence Limits
	N	p	N	p	.025 to .975
Oct. - Dec., 1980	11,865	.0406	3,209	.0206	.0140 to .0260
Jan. - Mar., 1981	15,688	.0367	4,533	.0212	.0104 to .0206
Apr. - June, 1981	15,367	.0388	5,105	.0272	.0062 to .0170
July - Sept., 1981	23,200	.0369	5,386	.0286	.0035 to .0133
Oct. - Dec., 1981	13,834	.0400	4,406	.0238	.0065 to .0175
Jan. - Mar., 1982	11,394	.0374	3,705	.0251	.0067 to .0189
Apr. - June, 1982	13,966	.0379	4,775	.0287	.0035 to .0149
July - Sept., 1982	21,112	.0395	3,081	.0172	.0173 to .0277
Oct. - Dec., 1982	14,972	.0511	2,888	.0360	.0075 to .0227
Jan. - Mar., 1983	14,653	.0334	2,020	.0168	.0103 to .0229
Apr. - June, 1983	13,655	.0319	1,090	.0110	.0141 to .0277
July - Sept., 1983	17,900	.0254	98	.0204	-.0347 to .0447
Oct. - Dec., 1983	12,895	.0251	672	.0119	.0046 to .0218
Jan. - Mar., 1984	15,500	.0285	995	.0291	-.0113 to .0101
Apr. - June, 1984	19,928	.0321	2,629	.0255	.0001 to .0131
Total	235,939	.0356	44,592	.0246	.0095 to .0125

proportions for the composite groups revealed that the overall proportions differed significantly at the .05 level of significance because the limits did not include 0 within the range. The differences were also significant for 13 of the 15 quarters. In all cases where significant diffferences were observed, the proportions were higher for the high school graduates than the corresponding proportions for the non-high school graduates. The results of comparing the proportions for the two composite groups required rejection of the null hypothesis of no difference in the proportions at the .05 level of significance.

Conclusions

The Navy's recruit population is described in this study based on data for selected variables that apply to the recruits entering the Navy during a 15-quarter period of time. The conclusions are derived from the descriptive analyses and the results of testing five hypotheses pertaining to specific variables.

With regard to years of education, the typical Navy recruit has completed about 12 years of education. An increasingly large majority of the recruits are high school graduates. The inferential analysis on high school graduation status indicates that higher percentages of high school graduates are included among the recruits during more recent quarters of the time period covered by this study.

The aptitude of recruits as reflected by means on the AFQT does not appear to vary in any consistent pattern among the recruits with RGL scores below 6.0 or the recruits with RGL scores above 6.0. The means indicate that recruits who score above the 6.0 criterion have greater aptitude than recruits who score below the 6.0 RGL criterion. The difference in the aptitude score means for the two groups suggests that they are dissimilar populations.

The reading comprehension means of recruits exhibit relative stability across the 15-quarter period, placing the composite group near the 10th grade level. The mean tends to be slightly higher during the latter quarters of the period covered by the study. The median for the period places the group near the middle of the 11th grade. The median for the composite group shows a slight trend toward higher comprehension levels among recruits as reported by Bowman and Kerr (1981, 1982, 1983) and Bowman, Kerr, and Darcy (1984).

Separate analyses of the distributions of high school graduate and non-high school graduate recruits classified by the 6.0 RGL criterion and quarter of entry into the Navy indicate that differences exist across the 15-quarter period for the high school graduates and the non-high school graduates. Among the high school graduate recruits, the percentages who score below the 6.0 RGL generally are higher during the latter quarters of the 15-quarter period of time. The percentages of non-high school graduate recruits scoring below the 6.0 RGL criterion tend to be more variable during the latter quarters of the study period.

Differences exist in the distributions of recruits who obtain RGL scores below 6.0 when classified by high school graduation status and quarter of entry in the Navy. Higher percentages of the recruits who score below the 6.0 RGL are high school graduates in the latter quarters of the period than in the earlier quarters. A higher proporiton of the composite group of high school graduate recruits score below the 6.0 RGL than is found in the composite group of non-high school graduate recruits. Significant differences exist for the composite groups and for the quarterly groups in 13 of the 15 quarters.

The findings suggest that the recruit population remains relatively stable while showing only slight variability with regard to means on years of education, reading comprehension skills, and aptitude scores. Several

variables reveal variability across the 15-quarter period. Factors for which distributions by quarter differ include high school graduation status, high school graduate recruits and non-high school graduate recruits who score above and below the 6.0 RGL criterion, and high school graduation status of recruits who score below the 6.0 RGL. The proportion of recruits who obtain RGL scores below 6.0 also is higher for high school graduates than for non-high school graduates.

The results of the study are important in three respects. First, the findings reveal that the trend of a decline in reading comprehension skill levels of recruits reported in previous studies (Duffy & Nugent, 1978; Bowman & Kerr, 1979; Bowman & Kerr, 1981) has been reversed during the 15-quarter period covered by the study. The study also indicates that the recruits who enter the Navy are likley to vary in different quarters of the year on some important factors. As a result, ART management personnel need to plan for adjustments in the requirements for resources as the recruit population changes throughout the year. By being aware of the variability in demands, more efficient allocation and utilization of the resources can be achieved for ART and the Recruit Training Centers. The study demonstrates as well that information is available through the CMI reports on Navy recruit characteristics to improve the effectiveness of program management. Consistent monitoring of these reports and basic analyses of the data would enable the staff to determine the changes occuring in the composition of the recruit population that affect the ART Program.

References

Biersner, R. J. (1975). Reading grade levels of Navy rate training manuals and nonresident career courses (CNET Report 2-75). Pensacola, FL: Chief of Naval Education and Training.

Bowman, H. L., Kaiser, R. A., Jones, P. L., & Petry, J. R . (1984). Literacy skills curriculum for Academic Remedial Training (1984). Millington, TN: Chief of Naval Technical Training.

Bowman, H. L., & Kerr, N. J. (1979). The developmenat and installation of a reading program for Academic Remdial Training in the U.S. Navy: skill profiles of recruits. Paper presented at the Mid-South Educational Research Association Annual Meeting, Little Rock, AR.

Bowman, H. L., & Kerr, N. J. (1981). An investigation of U.S. Navy recruit characteristics on reading comprehension and related varaibles. Paper presented at the Mid-South Educational Research Association Annual Meeting, Lexington, KY.

Bowman, H. L., & Kerr, N. J. (1982) A descriptive study on the reading comprehension and related characteristics of U.S. Navy recruits: a twelve-month profile. Paper presented at the Mid-South Educational Research Association Annual Meeting, New Orleans, LA.

Bowman, H. L., & Kerr, N. J. (1983). Reading comprehension and related characteristics of U.S. Navy recruits: a twelve-month description. Paper presented at the Mid-South Educational Research Association Annual Meeting, Nashville, TN.

Bowman, H. L., Kerr, N. J., & Darcy, D. M. (1984). Reading comprehension and educationally related characteristics of U.S. Navy recruits: twelve-month profile from June, 1983, to May, 1984. Paper presented at the Mid-South Educational Research Association Annual Meeting, New Orleans, LA.

Chief of Naval Technical Training. (1978). Academic Remedial Training curriculum. Millington, TN: Chief of Naval Technical Training.

Chief of Naval Technical Training. (1980). Verbal skills curriculum. Millington, TN: Chief of Naval Technical Training.

CNTECHTRAINST 1540.42. (1978). Academic remedial training (ART). Millington, TN: Chief of Naval Technical Training.

Duffy, T.M., & Nugent, W.A. (1978). Reading skill levels in the Navy (NPRDC Technical Report 78-19). San Diego: Navy Personnel Research and Development Center.

Hoiberg, A., Hysham, C. J., & Berry, N. H. (1974). Effectiveness of recruits assigned to Academic Remedial Training. Psychological Reports, 34, 1007-1014.

MacGinitie, W. (1978). Gates-MacGinitie reading tests (2nd ed). Boston: Houghton-Mifflin Company.

OPNAVINST 1510.11. (1982). Enlisted fundamental skills training. Washington: Department of the Navy.

SECNAVINST 1510.3. (1978). Remedial training in basic skills. Washington: Department of the Navy.

Sticht, T. G. (1982). Basic skills in defense (Final Report 82-6). Alexandria, VA: Human Resources Research Organization.

United States Military Enlistment Processing Command. (1967-80). Armed services vocational aptitude battery (Series 5-10). Ft. Sheridan, IL: United States Military Enlisthment Processing Command.

Zierdt, L. E. (1976). Remedial reading programs for personnel entering the United States Navy. Research report submitted to Air War College, Air University, Maxwell Air Force Base, AL.